DOCUMENT RESUME

ED 151 745 CS 003 976

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TITLE Reading Skill and Military Effectiveness.
PUB DATE Mar 78
NOTE 30p.; Paper presented at the Annual Meeting of the American Educational Research Association (Toronto, Canada, March 27-31, 1978) ; Not available in paper copy due to type size of original copy

EDRS PRICE MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS Enlisted Personnel; Failure Factors; *Military Personnel; *Military Training; *Performance Factors; Predictor Variables; *Reading Ability; *Reading Level; *Reading Research; Success Factors
IDENTIFIERS *Navy

ABSTRACT

A study was conducted to examine the relationship between the reading skill of male Naval recruits and their performance during the first year in the Navy, as indicated by discharge during or after recruit training, behavioral infractions, and recommendations for reenlistment. The average reading grade level equivalency score obtained on the reading test administered during the first week of recruit training was considered a man's reading score. Analysis of the results indicates that, in recruit training, reading was most predictive of discharge during the academic phase of training, suggesting that the academic demands of recruit training in interaction with low reading grade level is a potent discharge factor. There is no evidence in the data that reading was a factor in performance after recruit training. (GW)

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READING SKILL AND MILITARY EFFECTIVENESS

by Jane Sachar
Tom Duffy

Recent research on the reading skills of Navy personnel and the reading difficulty of Navy manuals has indicated a wide disparity between skill levels and material difficulty. Duffy (1976) in a survey of the reading skills of a large sample of Navy recruits found that 18% read below an 8th grade level. By comparison, Biersner (1975) reports that not one Navy manual, in an assessment of more than 400 manuals, had a readability score of less than a 9.0 reading grade level (RGL). A similar disparity between reading skills and reading requirements was reported by Carver (1974, a,b).

The above studies did not match Navy men to the manuals that they use. Thus, it is entirely possible that the classification process wherein men qualify for and are assigned to specific specialized training results in a closer match between reading skills and reading requirements. For example, Duffy, Aiken and Nugent (1977) found that men entering a designated specialty had considerably higher reading skills than nondesignated personnel. Because these men work in areas of specialization, they may also be expected to have both more extensive and more difficult reading. Thus, the classification process, to some degree, serves, to match reading skills and requirements. However, Duffy et al (1977) and Aiken, Duffy and Nugent (1977) found that even after classification, significant numbers of men within each occupational speciality (rating) have reading skills less then the difficulty of the manuals they use. In the latter study, the reading skills of a sample of men in each of ten technical training schools was compared to the reading difficulty of reading deficiency if his reading skill was two or more RGL's below the diffi-

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culty of the text. Aiken et al (1977) found only two schools where virtually none of the students had a reading deficiency, while in the other schools 20 percent to 55 percent of the students were deficient in reading skills. Duffy et al (1977), compared reading skills in 80 Navy ratings to the readability of a basic manual for each of those ratings. They found that in over half of the ratings the difficulty of the manual exceeded the reading skill of the majority of the men in the rating.

The results of these studies indicate that Navy manuals are written at a level of difficulty well beyond the reading skill of many of the users of the manuals. Based on findings such as these an assumption has been made that many errors and deficiencies in job performance are due to deficiencies in reading skills. This assumption underlies the reading programs at recruit training (Duffy, 1976), proposals to expand the reading training, and the Navy's current major effort to improve the readability and useability of job and training manuals (Sulit, 1976). The jump from a disparity between reading skills and readability of manuals to the assumption that reading deficiencies are affecting performance involves two intermediate assumptions. First, it must be assumed that reading is integral to the job, either in that reading must be done to complete the job or that reading plays a supportive role necessary for efficient job performance. If coworkers or supervisors are always present to supply information, or if because of the nature of the task or job experience reading is unnecessary , then a disparity between reading skills and manual difficulty is likely to be unimportant to effective job performance. With the large and continually increasing printed documentation for Navy systems (Sulit, 1976; Muller, 1976) it is probably safe to assume that reading is integral

to performance in most Navy ratings. However, for a particular rating, the reading required in that rating must be established before a reading deficiency can be assumed to be affecting performance.

The second intermediate assumption is that in order to perform effectively, a man must be able to read at least at the grade level indicated by a readability assessment of his job reading materials. In fact, a readability metric is an imprecise instrument, developed on particular types of material, utilizing somewhat arbitrary procedures for determining grade level equivalents, and defining "comprehension" as the ability to guess words deleted from a paragraph or to answer questions about a paragraph (Klare, 1963). Because of these factors, the reading skill level required in a particular job area will typically have to be empirically determined rather than simply defined in terms of a readability score of the material. If a manual is utilized primarily as a reference tool, e.g., to find a particular specification or part number, then the reading skill required is probably considerably less then that indicated by the readability of the manual. That is, this "look up" reading task will demand considerably less (lower level) comprehension skill then the comprehension on which the readability metric is based. However, if the task is to synthesize information for later use, then a higher reading level than that indicated by the metric may be required.

A "reading deficiency", then, can be calculated simply by comparing reading skills and readability, although this deficiency score may not be related to performance. A relationship between degree of reading deficiency and performance must be empirically demonstrated. For example, Kulp (1974) prepared instructions for an assembly task at three levels of difficulty (readability) and assessed

the ability of subjects to perform the assembly task. For each set of instructions, performance was found to decrease when reading skills were more than two grade levels below the difficulty of the instructions. Thus, a two grade level deficiency was tolerable in this situation. In the Kulp (1974) study the amount of reading, the difficulty of the material, and the necessity for reading were all controlled in a laboratory setting. Thus, extraneous variables could be controlled and reading deficiency could be examined independently of both the difficulty of the material and the reading skill of the worker. Unfortunately, such controls are seldom possible in actual job situations. Therefore, converging evidence must be utilized in establishing that a deficiency in reading skill is responsible for reduced job performance. For example, Klare (1973) found a strong relationship between the readability of the manuals for 17 Armed Forces correspondence courses and the percent of men completing the courses. Klare was unable to assess the reading skill of the men taking the courses, but it is reasonable to assume that the skill varied widely within each course. Thus, he proposed that as the reading difficulty of the manuals increased, more men were unable to readily read and comprehend the manual and, therefore, dropped out of the course. However, it is just as reasonable to assume that the increased reading difficulty was associated with increased conceptual difficulty and standards for performance and these variables, in addition to or perhaps rather than a reading deficiency, were responsible for the drop-out rate.

A recent study by Aiken, Duffy and Nugent (1977) illustrates the use of converging evidence. The intent of this study was to develop procedures for inferring that reading skill is causally related to performance. They examined the relationship between reading skill and performance in ten Navy technical training schools. In several of the schools, a large correlation (relative to other predictors of performance) was obtained between reading skill and per-

formance. Additionally, they found a significant number of men reading at a level below the difficulty of the manual. However, in some of these schools there was very little required reading. Thus, even though reading and performance were related and significant numbers of men were reading at levels well below the difficulty of the manual, the fact that little reading was required in these schools suggests that reading still may not be a critical determinant of performance. Since little reading is required, a deficiency in reading skill relative to the manual difficulty is of minimal importance. General ability, which correlates highly with reading skill, may have been responsible for the correlation obtained. Thus, in inferring a causal effect of reading, the reading skills, manual readability, and amount of material read must all be considered.

Sticht, Caylor, Kern and Fox (1971) found a strong relationship between reading skill and the ability of Army personnel to perform a job in their area of specialization when the men voluntarily used their manual. As in the Aiken et al (1977) study, this relationship could have simply been due to the strong relationship between general ability and reading skill. That is, the better readers were likely higher in general ability and this factor, rather than reading, resulted in the higher level of performance. However, Sticht et al (1971) found that the relationship between reading skill and performance was considerably less for those men who did not use the manual while performing these jobs. Thus, reading the manual, rather than general ability, was the important factor in the relationship between reading skill and job performance.

The importance of going beyond the simple correlation between a particular measure of reading and job performance to infer a causal relationship lies in the corrective actions which may be taken. The simple correlation, if strong

enough, may warrant the use of a reading test in selecting personnel for a job. The interest here is in reading test performance, not in the reading required for the job. The reading test serves simply as a predictive instrument and the conceptual underpinnings of the test are irrelevant. However, if in addition to the correlation, it can be established that reading skill (or a deficiency in reading skill) is responsible for decreased performance, then not only can the reading test be used as a selection instrument, but a number of intervention strategies for improving performance can be implemented. The options for intervention are discussed in detail by Aiken et al (1977) and include simplifying the text material, reducing the amount of reading required and training reading skills.

Purpose

The present research examines the relationship between reading skill and indicants of performance during the first year in the Navy. The reading test data on Navy recruits, reported in Duffy et al (1977) serves as the basic reading skill data. A man's performance or Navy effectiveness is indexed by discharge during or after recruit training, behavioral infractions, and recommendations for reenlistment.

The utility of incorporating a reading test in the selection and job classification test batteries will be examined by determining the incremental predictive validity for each of the performance measures, i.e., the improvement in prediction, when reading test performance is utilized in conjunction with the existing measures. To the extent that the reading test measures a skill distinct from the skills measured by the other tests, it is expected that the reading test will serve as a useful predictive instrument. In addition to assessing

the predictive value of the reading test, data will be gathered to assess the causal role of reading skill in determining performance. It is hypothesized that if reading deficiencies are causing performance deficiencies then the relationship between reading skill and performance will be stronger when reading is required than when it is not. Two tests of this hypothesis will be made. First, the relationship between reading test scores and discharge during the first half of recruit training, when little reading is required, and during the second half of recruit training, when academic classes are held, will be compared. Secondly, the relationships between reading test scores and each performance criterion will be determined for men receiving and men not receiving specialized training after recruit training. As discussed previously, men receiving specialized training engage in more reading in terms of both classroom and on the job requirements. Therefore, a stronger relationship between reading and performance is expected for these men.

A second hypothesis is that performance of men working in a specialized area will increase as the reading skills increase relative to the estimated reading difficulty of the material they encounter. A reading deficiency score for each man in each rating will be calculated and the relationship between reading deficiency and each performance indicant will be examined for ratings where the reading difficulty of material is high and ratings where the difficulty is low. If reading deficiency is an important factor in performance then the relationship between deficiency and performance should hold regardless of the difficulty of the materials.

METHOD

Subjects

The subject population and data base described in Du fy, et al (1977) was utilized in the present research. In that study reading test data was obtained on all available male recruits (N = 31, 540) entering recruit training in San Diego between 13 May 1974 and 30 May 1975. In the present study men reading below a 3.0 grade level (N = 272), nonnative English speakers (n = 3,789), and men for whom the personnel data was inadequate (N = 1494) were eliminated from the Duffy et al data data set, yielding a final sample of 26,032. The sample size was further reduced for specific criterion measures. The details of these reductions in sample size are described below.

The nonnative English speakers consisted primarily of Filipinos, who, previous data (Duffy et al 1977) indicate, have a median reading level significantly lower then that of native English speakers. This reading skill difference between native and nonnative English speakers is relevant to an evaluation of the effects of reading skill on service effectiveness. However, the sample size of nonative English speakers is inadequate for an evaluation of the interaction of language skill and language background on Navy effectiveness. Additionally, at the time the data was collected, Filipinos tended to follow a restricted number of career paths in the Navy. This career path restriction in combination with the lower reading skills could contaminate an evaluation of the relationships of reading skill to Navy effectiveness. Therefore, nonnative English speakers were excluded from the present sample.

The Gates-MacGinitie reading test used to assess reading skill, was also used as a preliminary screening instrument by the Recruit Training Command, during the data collection period. Recruits scoring below a 3.0 RGL were recommended for discharge if follow-up evaluation varified the initial test score. Therefore men scoring below a 3.0 RGL were excluded from the sample since they would artificially enhance the reading skill - - Navy effectiveness relationship.

The failure to find personnel data on 1494 men is due primarily to incorrect recording of social security numbers either at the time of administering the reading test or in the Navy records and to incomplete data on some of the records.

Reading Testing

The Gates-MacGintie reading test was administered during the first week of recruit training. The details of the administration are described in Duffy et al (1977). The average RGL equivalency score obtained on the vocabulary and comprehension subtests was considered a man's reading score. The vocabulary subtest is a 50 item multiple choice test requiring synonym recognition. The comprehension subtest is a 50 item multiple choice cloze test (Taylor, 1957). That is, every fifth word in a set of interconnected sentences is deleted and the subject chooses, from a set of four, the word which best fits the blank.

The Gates-MacGinitie test, Survey D is designed for use in the fourth to sixth grades. It was selected and used by the Recruit Training Command at the time of data collection to identify low ability readers. The test was empirically normed on students in grades three through nine. The norms are extrapolated

down to grade two and up to grade twelve. This limitation in the range of the test norms resulted in an inability to discriminate the reading skills among the above average readers in the Navy. Duffy, et al (1977) found the distribution of scores for Navy recruits to be highly skewed, with approximately 60% of the sample reading in the 10.0 RGL to 12.0 RGL range. This skewness may be expected to reduce correlational effects. However, there is no reason to doubt that the underlying distribution of reading skills is normal.

Personnel Data

The Navy computer records were searched to obtain information on those test scores used to predict the potential success of a man in the Navy. The tests are the Armed Forces Qualification Test (AFQT) and the Odds For Effectiveness (OFE) test. The AFQT is an indicant of general ability and the score reflects a man's rank in the population of applicants for enlistment in the Armed Forces. The score is derived from a combination of tests in the Navy's Basic Test Battery. The OFE is an actuarial table using AFQT, years of school completed, arrest records, and school explusions to obtain the probability of successfully completing a tour of enlistment in the Navy.

In addition to the test data information on years of education and native language were obtained.

Navy Effectiveness

Three indicants of performance or Navy effectiveness were obtained from the computer records. These were discharge from the Navy, delinquency or behavioral infractions, and recommendation for reenlistment. Both the reason

for discharge and the date of discharge were obtained. All discharges reflecting on inability to perform effectively were considered as a single category, discharged. This included discharges for misconduct, inaptitude, security, unfit, and good of the service. Men discharged for reasons other than an inability to perform effectively were eliminated from the data set since these types of discharges are not related to performance. These discharges include being a minor, incurring a medical disability, death, or an honorable discharge for the convenience of the government. Less than 1000 fell into these discharge categories. Approximately 850 men were not in the service a year when the final data were collected. Both groups were eliminated from the sample when discharge was the criterion. Thus, with discharge as the criterion variable, the sample size in various time intervals ranged from 22,843 to 25,338.

Behavioral infractions includes any history indicating , desertion, military or civilian confinement, court martial or demotion. Behavioral infraction is as a dichotomous variable; a man with an entry in any one of the above categories was considered a behavioral problem. There were 882 men for whom no information was available on this variable. Thus, the sample size for analyses involving this measure was 25,813.

Men are evaluated every six months as to their potential benefit to the Navy if they reenlist. If the evaluation indicates the man is likely not to be a benefit to the service an entry of "not recommended for reenlistment" is entered on the enlisted master tape. This dichotomous variable was used as the third indicant of Navy effectiveness. There were 882 men for whom no information on this variable was available. Thus, the sample size for analyses involving this measure was 25,813.

Reading Task Difficulty

It is virtually impossible to precisely assess the difficulty of the reading materials utlized by men during their Navy careers. In addition to the variation in the purpose for reading (look up, follow a procedure, learn for a test), there is wide variation in the amount of reading required even in the same area of specialization. In the present study we estimated the difficulty of materials encountered in each area of specialization (each rating), on the basis of the difficulty of the rate training manual for advancement to second and third class. This manual contains the information the men are expected to have learned and to understand by the time they have completed their first tour of enlistment. Promotion to second class is based in part on the ability to pass a test on information contained in this manual. The manuals are also frequently utilized as a classroom text for intital training ("A" school) in a man's area of specialization. In previous work (Aiken et al, 1977) it was found that this manual was used as a text in 8 out of 10 "A" schools. Thus, the information in the manual represents job knowledge requirements and serves as a text for both training and study for advancement. Additionally, preparation of the manuals frequently involves utilization of materials taken directly from job manuals. Thus, it is expected that these manuals provide a reasonable representation of the reading tasks encountered by men in an area of specialization.

The readability of the rate training manuals was obtained from Biersner (1975). Readability was calculated by Biersner using a Flesch readability formula which has been normed on Navy men and materials.

RESULTS AND DISCUSSION

Anyone discharged within 12 weeks of entering the service is considered to be a recruit training loss. This interval is slightly longer than the 9 week duration of recruit training so as to compensate for administrative or other delays in the actual issuance of the discharge. Discharges from 13 to 52 weeks after entering the service are classified as post recruit training losses. During the first 52 weeks in the service, 11% of men in our sample were discharged; 4% in recruit training and 7% post recruit training. Table 1 presents the number and percent of men at each reading level who were discharged during recruit training or post recruit training (see figure 1 for graphic representation). For both time periods a consistent curvilinear relationship is evident, with the greatest change in discharge rate occurring at the lower reading levels. The relationship is somewhat more pronounced during recruit training with percent discharged ranging from 51% for men with less than a fourth grade reading level to less than 2% for men above an 11.0 RGL. Consistent with this, the mean reading level of recruit training discharges (8.0 RGL) was lower than that for post recruit training discharges (9.2 RGL), and both have lower reading skills than the men not discharged during the first year (10.4 RGL). The data, thus far, indicate that lower level readers are more apt to be discharged from the service and this effect is greater during recruit training. If the curve representing the relationship between discharge rate and reading level, evident in figure 1, were S-shaped, there would be a range of cutscores below which virtually all individuals are discharged and above which virtually none are discharged. Because these data do not conform to that situation, it is difficult to choose an RGL cutoff score for policy usage. However, given a significant relationship between RGL and discharge, the

choice of a minimum acceptable RGL may be based on what is considered to be a tolerable loss of potentially nondischarged enlistees.

If relative costs can be assigned to the misclasssifications, a policy may be determined. That is, if it is not crucial to reject a large percentage of men who would not be discharged, the policy for selecting applicants would be quite different from the situation in which it is important to identify as many of these individuals as possible. Similarily, if it is extremely costly to accept an individual who will be discharged, the decision strategy is different from the situation in which such costs are minimal. The effect of introducing these costs is to move the "cutscore" up if misclassifying those who will be discharged is more costly or down if it is less costly. Because we are not in a position to assign such values, we will interpret our data from an equal, higher, and lower cost of misclassifying those who will be discharged relative to those who will not. Table 2 indicates the percent of those discharged identified, the percent of nondischarges not accepted, and the percent of the total population correctly identified in recruit training for various RGL minimum scores.

First assume that the cost of misclassification is equal for those discharged and those not discharged. Then the percent of the total correctly classified is the relevant index. Because of the low discharge rate, the largest percent of the total correctly classified (96%) is given when the test is not used and every individual is accepted into the service.

If, however, the recruiting climate is such that the selection ratio is low, that is, the pool of applicants is far greater than the number selected, then misclassifying an individual who would not have been discharged is not a crucial issue. In this situation, it is important to identify those who will be discharged. With an RGL cutscore of 8.0, 48% of those discharged are identified with a loss of only 11% of those who would not have been discharged. If more than 11% can be "lost", then the cutscore may rise even higher.

With a very high selection ratio, the Navy must accept a very large proportion of the applicants. Thus, incorrectly classifying individuals who would not be discharged is undesirable. With an RGL minimum of 5.0, 20% of those discharged are identified at a loss of only 2% of those not discharged; at 4.0, the reading test identifies 11% of those discharged at a loss of only .5%.

Thus, the use of a minimum performance level on the Gates-MacGinitie reading test can be used effectively to identify a substantial percentage of those who will be discharged, losing a much smaller percentage of those who would have been effective. To meet the needs of the Navy, the relative value of identifying those discharged compared to losing those who would be successful must be assigned. The mimimum Gates-MacGinitie RGL may, then, be selected.

To apply these results to the entire Navy, verification must be made that these relationships hold for nonnative English speakers. If the relationships are not the same, differential criteria (cutscores) may be applied for native and nonnative English speakers.

Several operational measures were in use at the time of this study for selecting applicants into the Navy, namely the odds for Effectiveness (OFE), Armed

Forces Qualification Test (AFQT), and years of schooling completed. The intercorrelations of these variables with each other, with the reading test, and with recruit training discharge, are shown in Table 3. The reading test correlates most highly with discharge ($r = .25$). Because the three operational predictors have already been used to screen applicants, their correlations with discharge are smaller than those that would have been obtained prior to selection. The three operational predictors and the reading test do not correlate very highly ($.29 \leq r \leq .60$), suggesting that they are measuring different factors. Our future efforts will be directed toward assesing the predictive power of using all four predictors simultaneously to predict discharge with a discriminant function.

In addition to the question of the utilization of the reading test as a selection instrument is the question of whether or not an inability to effectively utilize Navy textual materials underlies the reading and discharge relationship evident in Figure 1. That is, do the data in Figure 1 represent the effects of deficient reading skills? To provide evidence relevant to this question, we first examined whether or not the introduction of academic material into recruit training affects the relationship of RGL and discharge. That is, if deficient reading skills underlie the RGL-- discharge relationship, then the relationship should be considerably stronger when reading requirements (academics) are introduced. In recruit training, the first four weeks are devoted to physical conditioning and training of military skills. After week four, a portion of each day is spent in the classroom where the Blue Jackets manual serves as the basic text and weekly academic tests are administered. The relationship between RGL and discharge for the academic and nonacademic phases of recruit training are presented in Figures 2 and 3. In both figures it is clearly evident that RGL is more strongly related to discharge in the

in the academic phase. There is only a 2% difference in discharge of high and low skill readers during the nonacademic phase, while the difference increases to 11% during the academic phase (figure 3). The results clearly support the inference that the introduction of reading requirements and an inability to accomplish the reading tasks underlies the discharge rate. It must be remembered, however, that the relationship is derived from a descriptive, rather than manipulative, situation. Thus, the analysis of the academic and nonacademic phases provides data that suggest possible underlying factors. The introduction of academics increases the requirements for a variety of skills in addition to reading, e.g., memory, ability to synthesize and organize information, listening, etc. Most of these other skills are called for in reading as well as in other academic tasks. Thus, as presented in the introduction, the only means of insuring that reading is a causal variable is to manipulate the reading tasks independently of all other tasks. This is typically impossible in an operation setting and inferences must be based on less optimal data sets, e.g., the effects of introducing academic requirements.

Further inferential evidence on the causal role of reading is available in the comparison of the effectiveness of designated and nondesignated personnel after recruit training. Approximately 75% of Navy enlisted men (65% in the present sample) who successfully complete recruit training enter designated ratings. These men typically enter academic training and then work in the Fleet in their area of specialization. Nondesignated personnel do not receive specialized training and typically serve as assistants or aids in the Fleet. Thus, if reading is a factor in post recruit training performance we would expect the relationship between reading and each performance measure (discharge, behavioral infractions and recommendation for reenlistment) to be stronger for designated personnel.

Turning first to discharge, the data in Figure 4, indicate little if any, relationship between RGL and discharge for designated personnel. There were not a sufficient number of designated men in the 3.0-3.9 and 4.0-4.9 RGL categories (N = 12 and 35 respectively) to provide stable data points. From the 5.0 to 12.0 RGL levels there is virtually no variation in the discharge rate. The nondesignated personnel, in contrast, show a U-shaped relationship between RGL and discharge such that both high and low reading skills are related to high discharge rate. These data do not support reading as a causal variable in post recruit training discharge. For nondesignated personnel it appears that the test is measuring general ability. That is, since there are few reading requirements for these men, the high discharge rate at low reading levels may simply reflect a general inability to perform effectively. The high level readers also show a high discharge rate which clearly can't be due to an inability to perform effectively. However, given these men are of high general ability, they will likely derive little job satisfaction in their work as nondesignated personnel. Because of this dissatisfaction they may be expected to engage in behaviors which will lead to a discharge. (See Ronan, 1973, on the relationship of job satisfaction and labor turnover).

The general ability and job satisfaction interpretations are supported by the behavioral infractions data shown in Figure 5. As the reading skill of nondesignated men increases, the percentage of men with behavior problems also increases. A feasible interpretation involving reading skill and requirements is highly unlikely. Rather, once again, it appears that the more capable men find the work in nondesignated ratings unsatisfactory and undemanding. They may have behavior problems due to job frustrations or perhaps the behavioral infractions are the only means they have of getting out of an unsatisfying job.

In comparison, the lower level readers in the nondesignated ratings show the lowest percentage of behavioral infractions, even though they have the highest discharge rate. That is, these men are working at their jobs but simply do not have the general ability required to perform effectively. In terms of the reading test, this indicated by an RGL below 5.0.

For designated personnel, the relationship of RGL to behavioral infractions is somewhat stronger than it is to discharge. However, because of the findings for the nondesignated personnel, it is not possible to judge whether or not the relationship is due to the reading demands these men encounter.

Finally, the findings on recommendations for reenlistment (Figure 6) are consistent with the previous findings on discharge. The data do suggest that the recommendations are based on the general ability of the men rather than the likelihood that the men will create a disturbance. That is, men who have low reading skills (low general ability) are not recommended for reenlistment, even though they have the lowest incidence of behavioral infractions. In contrast, the high skill readers (high general ability) have the lowest incidence of non-recommendation even though they show the highest incidence of behavioral infractions.

Reading grade level is related to reenlistment recommendations for designated personnel. The percent not recommended drops systematically across RGLs, from 40% for the 5.0-5.9 RGL to 25% for 11.0-12.0 RGL. Again, however, the role of reading requirements in this relationship cannot be assessed.

The final hypothesis to be evaluated is that the extent to which reading skills are deficient, relative to the difficulty of the materials used, the poorer will be performance. Only designated personnel were used in this analysis since these are the men for whom reading tasks are frequent. Additionally, only men with RGLs less than 11.0 were included in the analysis. Since the reading test norms ceiling at 12.0 RGL, men with reading skills above a 12.0 RGL will be inaccurately assessed as reading in the 11.0 to 12.0 RGL range. Finally, the men were divided into two groups based on whether the estimated readability of their materials was less than 11.0 RGL or greater than or equal to 11.0 RGL. The sample sizes were 698 and 4407 for the respective groups. If a deficiency in reading skill is affecting performance, then the two groups should yield identical relationships between reading deficiency and performance. Reading deficiency was computed by subtracting the RGL score of a man from the estimated readability (in RGL units) of the text material he used. Performance was measured by the occurrence of behavioral infractions.

The results of the analysis are presented in Figure 7. There is no indication of any systematic relationship between reading deficiency and behavioral infractions. A similar lack of consistency was obtained when discharge and recommendation for reenlistment were used as dependent measures. Thus, there is no evidence in the present data that reading is a factor in performance after recruit training.

CONCLUSION

The results of this research indicate that the use of a reading test can improve the screening of men who will eventually be discharged from the service or will be a disciplinary problem. The selecction of an appropriate reading test score criterion will depend on the available manpower pool and the assessed cost of discharge.

Simply identifying a reading test as a predictor of discharge does not allow one to go beyond using the test in selection and classification. In essence, as Goodstadt and Glickman (1975) point out, simple predictive studies typically lead to the conclusion that the reason for discharge resides solely in the background and character of the man. If discharge and disciplinary problems are to be managed effectively, then the determinants of these factors in terms of the characteristics of the man in interaction with specific organizational demands must be specified. With such specification, intervention strategies can be utilized.

In the present research, the attempt was made to assess the determining role of reading skill deficiencies in the relationship of reading and performance. In doing so, we found that in recruit training, reading was most predictive of discharge during the academic phase of training. These results suggest that a reading deficiency may well underlie the relationship. More generally, one can infer that the academic demands of recruit training in interaction with low reading skills is a potent discharge factor.

After recruit training the test did not reflect the effects of academic demands. In fact, reading was more strongly related to each performance criterion for those men not facing academic demands or high reading requirements. However, the data do suggest that the test reflects the demands of the general abilities of nondesignated personnel. In this regard, the data suggest that high ability men in nondesignated ratings do not find their jobs sufficiently challenging. These men show both a high discharge rate and a high occurrence of behavioral infractions even though they are mentally capable. Thus, job dissatisfaction may be leading to behavioral infractions out of boredom, frustration or a direct attempt to gain a discharge from an unsatisfying situation.

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Table 1

Frequencies and Rates of Discharge during (A) Weeks 0-12 and (B) Weeks 13-52

Reading Grade Level Range	(A) Discharge during weeks 0 through 12			(B) Discharge during weeks 13 through 52		
	Number Discharged	Number Not Discharged	Percent Discharged	Number Discharged	Number Not Discharged	Percent Discharged
3.0-3.9	112	109	50.7	34	71	32.4
4.0-4.9	84	264	24.1	56	199	22.0
5.0-5.9	106	528	16.7	56	453	11.0
6.0-6.9	85	728	10.5	80	616	11.5
7.0-7.9	95	1116	7.8	85	978	8.0
8.0-8.9	80	1563	4.9	123	1353	8.3
9.0-9.9	106	2465	4.1	180	2160	7.7
10.0-10.9	129	4725	2.7	292	4203	6.5
11.0-12.0	205	12636	1.6	685	11131	5.8

Table 2

Percent of Classification in Recruit Training for Various Gates-McGinite Minimal RGL's for Selection

RGL Cutscores	Percent of Discharged Identified	Percent of Nondischarges Lost	Percent of Total Correctly Identified
None	0	0	96
4.0	11	0.5	96
5.0	20	2	95
6.0	30	4	93
7.0	39	7	92
8.0	48	11	87
9.0	56	18	81
10.0	67	28	72
11.0	80	48	53

Table 3

Correlation Matrix of Predictor Variables

	Years of Education	AFQT	OFE	Gates-McGinite reading grade level	Recruit Training Discharge
Years of Education	1.00	.32	.63	.29	.11
AFQT		1.00	.53	.60	.15
OFE			1.00	.42	.16
Gates-McGinite reading grade level				1.00	.25
Recruit Training Discharge					1.00

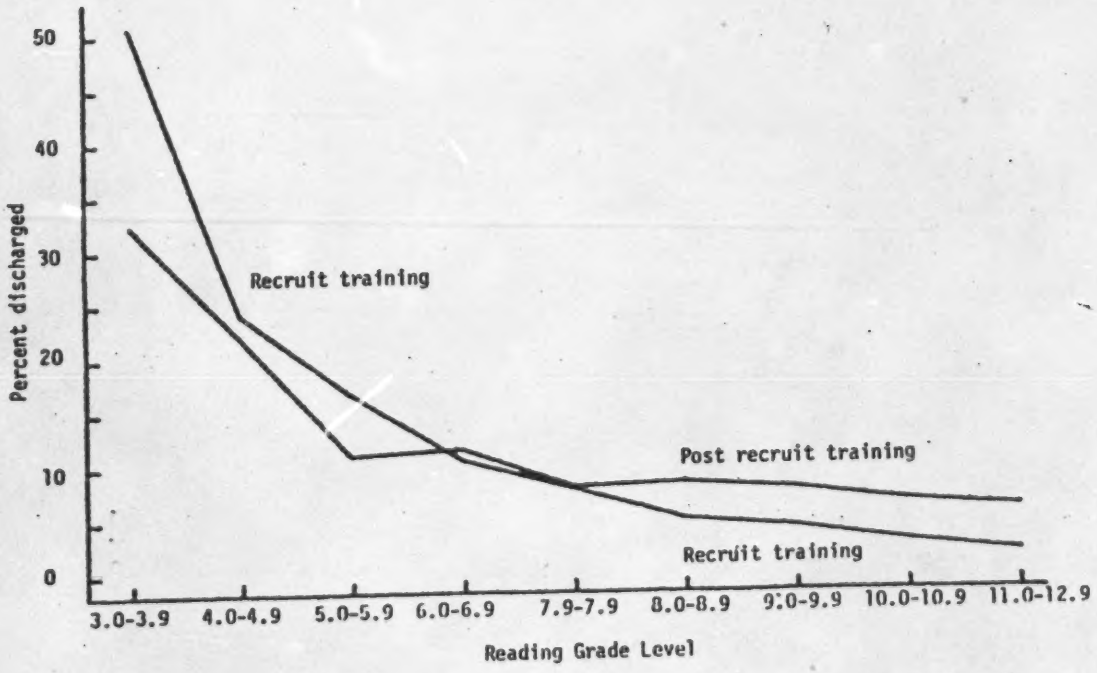

Figure 1. Percent discharged by reading graded level during recruit training and post recruit training period.

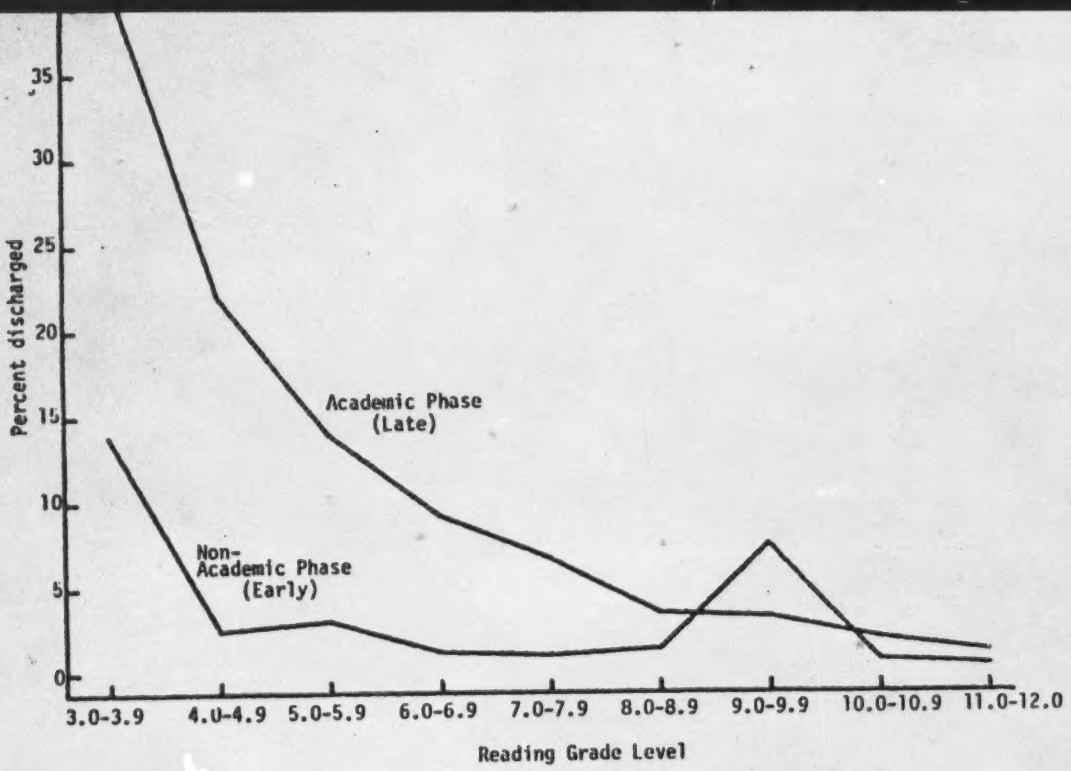

Figure 2. Percent discharged by reading grade level for nonacademic phase (early) and academic phase (late).

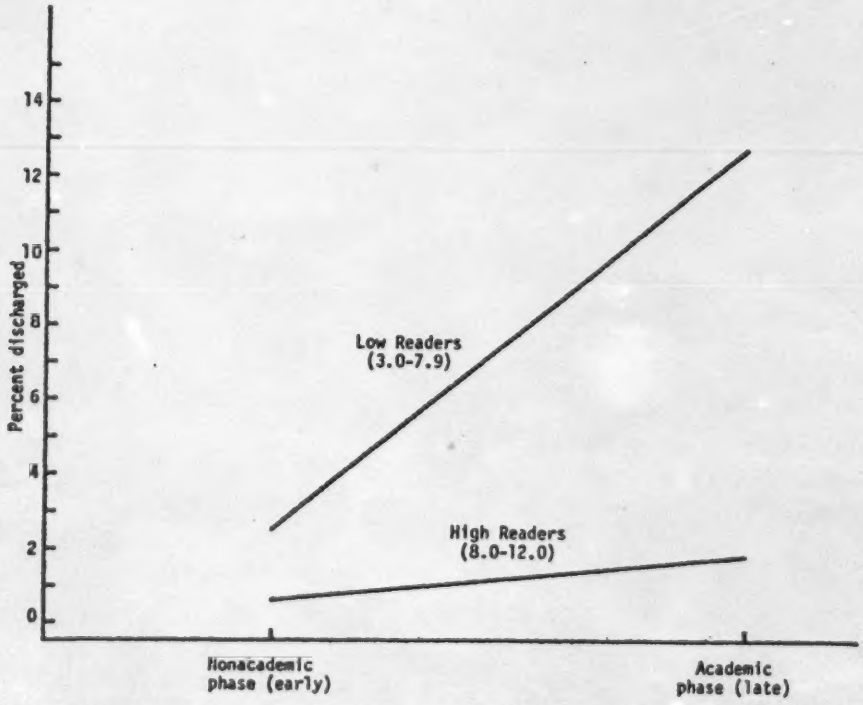

Figure 3. Percent discharged for low readers ($3.0 \leq RGL \leq 7.9$) and high readers ($3.0 \leq RGL \leq 12.0$) for nonacademic phase (early) and academic phase (late).

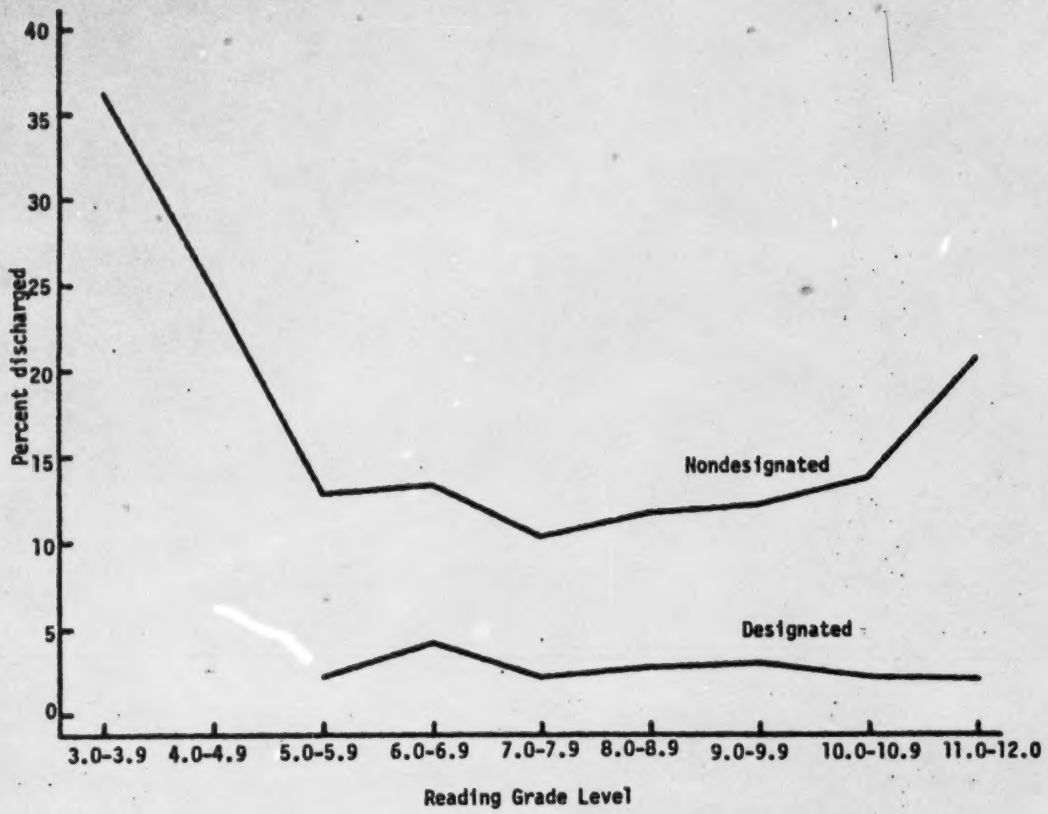

Figure 4. Percent discharged by reading grade level for designated and nondesignated personnel.

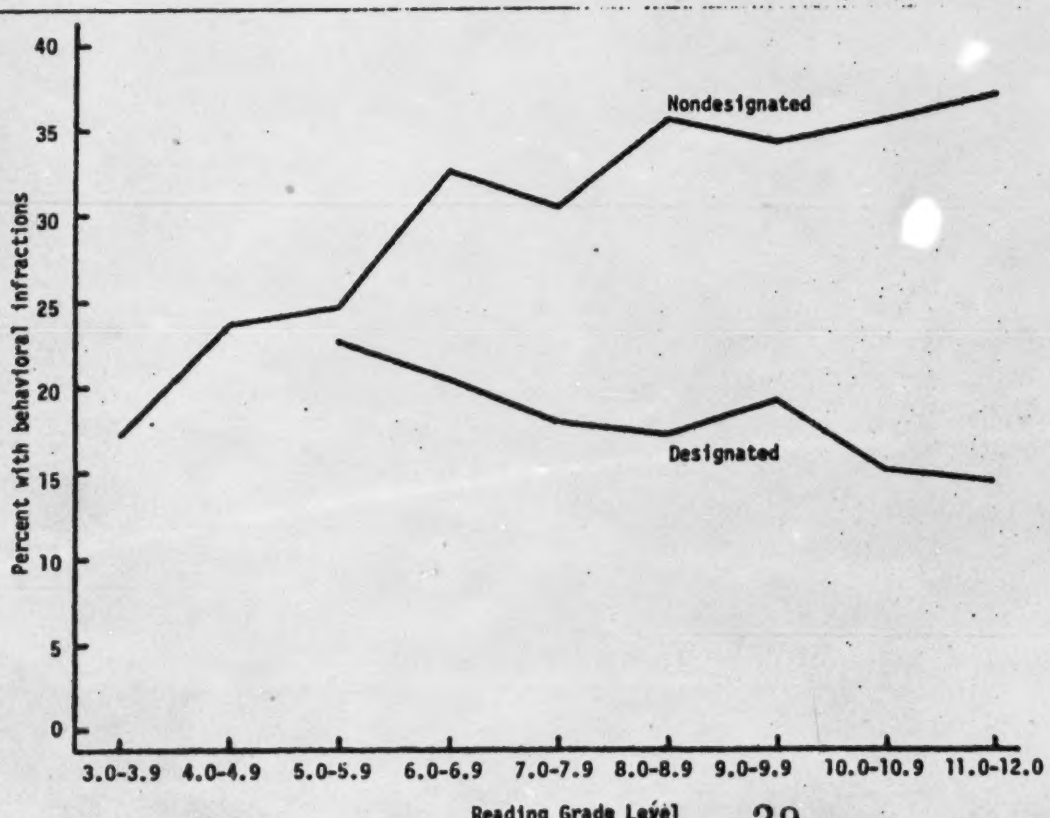

Figure 5. Percent of behavioral infractions by reading grade level for designated and

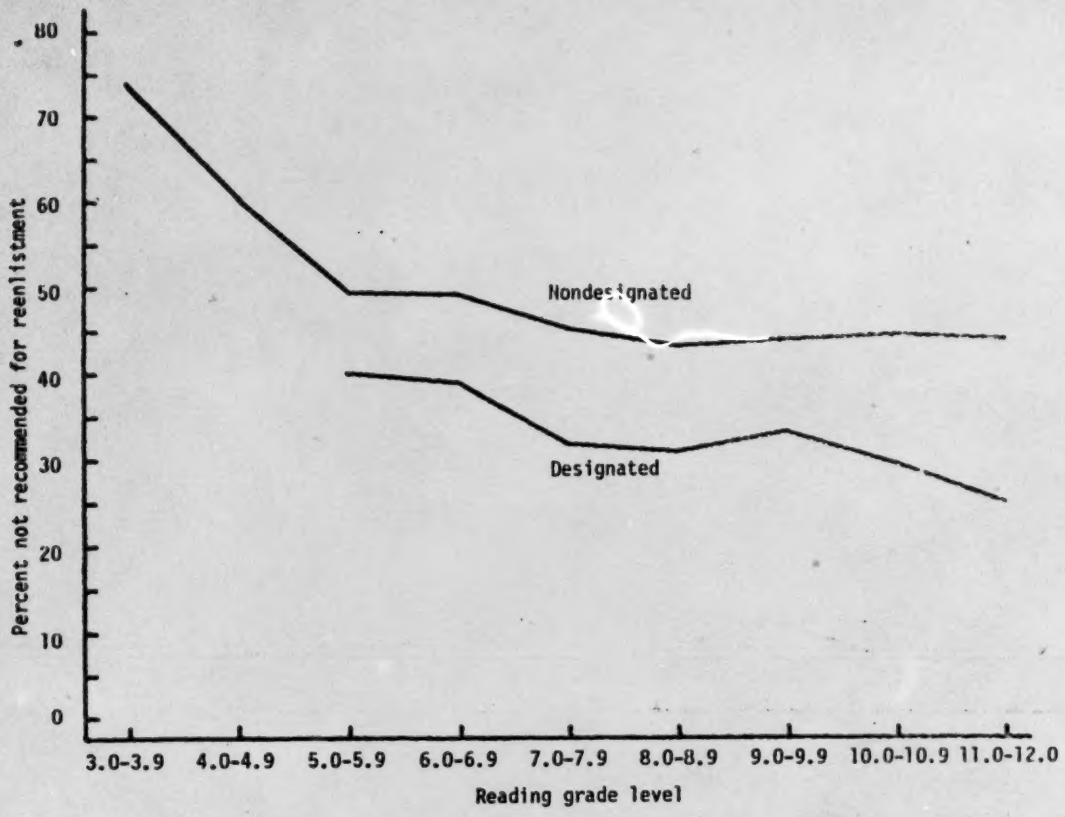

Figure 6. Percent not recommended for reenlistment by reading grade level for designated and nondesignated personnel.

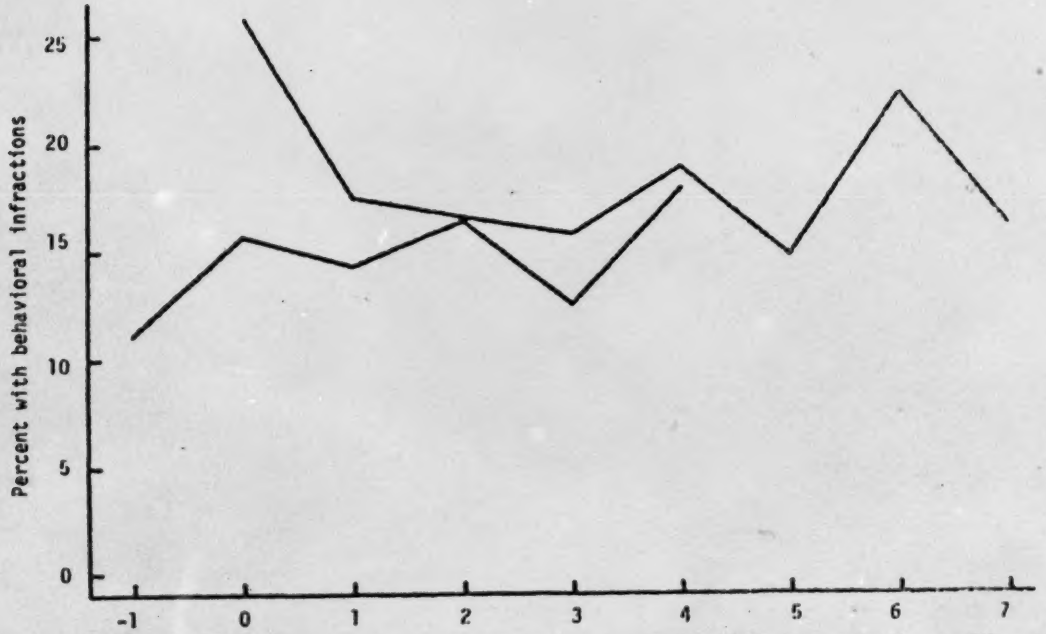

Figure 7. Percent with behavioral infractions by reading deficiency for those with manual readabilities less than 11.0 RGL and greater than or equal to 11.0 RGL